

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25372

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F25J 3/00; F17C 9/02; F02C 7/143

US CL : 62/620; 50.2; 60/39.02, 643

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 62/620; 50.2; 60/39.02, 643

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
None

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 3,837,172 A (MARKBREITER et al) 24 September 1974 (24.09.1974), see entire document.	1,3,4,8,9,10-12,16 ----- 2,5-7,13-15,17-20
X — Y	US 5,114,451 A (RAMBO et al) 19 May 1992 (19.05.1992), see figures 1-4 and col. 3 lines 51-61.	1,3,4,8-12 and 16 ----- 2,5-7,13-15 and 17-20
Y	US 5,457,951 A (JOHNSON et al) 17 October 1995 (17.10.1995), see figure 1.	2,17-19
Y	US 6,125,653 A (SHU et al) 03 October 2000 (03.10.2000), see entire document.	5-7,13-15,20
A	US 4,456,459 A (BRUNDIGE) 26 June 1984 (26.06.1984), see entire document.	1-20
A	US 2002/0174679 A1 (WEI) 28 November 2002 (28.11.2002), see entire document.	1-20
A	US 2003/0005698 A1 (KELLER) 09 January 2003 (09.01.2003), see entire document.	1-20

☒ Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

12 November 2003 (12.11.2003)

Date of mailing of the international search report

05 DEC 2003

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

William C Doerrler

Telephone No. (703) 308-0861

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## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,374,591 B1 (JOHNSON et al) 23 April 2002 (23.04.2002), see figures.	1-20
A	US 4,121,917 A (BAKER et al) 24 October 1978 (24.10.1978), see entire document.	1-20